

Mark Scheme (Results)

June 2011

GCSE Mathematics (1380)
Paper 2F

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Publications Code UG028360

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NOTES ON MARKING PRINCIPLES

1 **Types of mark**

M marks: method marks

A marks: accuracy marks

B marks: unconditional accuracy marks (independent of M marks)

2 **Abbreviations**

cao – correct answer only

ft – follow through

isw – ignore subsequent working

SC: special case

oe – or equivalent (and appropriate)

dep – dependent

indep - independent

3 **No working**

If no working is shown then correct answers normally score full marks

If no working is shown then incorrect (even though nearly correct) answers score no marks.

4 **With working**

If there is a wrong answer indicated on the answer line always check the working in the body of the script (and on any diagrams), and award any marks appropriate from the mark scheme.

If working is crossed out and still legible, then it should be given any appropriate marks, as long as it has not been replaced by alternative work.

If it is clear from the working that the “correct” answer has been obtained from incorrect working, award 0 marks. Send the response to review, and discuss each of these situations with your Team Leader.

If there is no answer on the answer line then check the working for an obvious answer.

Any case of suspected misread loses A (and B) marks on that part, but can gain the M marks. Discuss each of these situations with your Team Leader.

If there is a choice of methods shown, then no marks should be awarded, unless the answer on the answer line makes clear the method that has been used.

5 **Follow through marks**

Follow through marks which involve a single stage calculation can be awarded without working since you can check the answer yourself, but if ambiguous do not award.

Follow through marks which involve more than one stage of calculation can only be awarded on sight of the relevant working, even if it appears obvious that there is only one way you could get the answer given.

6 Ignoring subsequent work

It is appropriate to ignore subsequent work when the additional work does not change the answer in a way that is inappropriate for the question: e.g. incorrect canceling of a fraction that would otherwise be correct

It is not appropriate to ignore subsequent work when the additional work essentially makes the answer incorrect e.g. algebra.

Transcription errors occur when candidates present a correct answer in working, and write it incorrectly on the answer line; mark the correct answer.

7 Probability

Probability answers must be given as fractions, percentages or decimals. If a candidate gives a decimal equivalent to a probability, this should be written to at least 2 decimal places (unless tenths).

Incorrect notation should lose the accuracy marks, but be awarded any implied method marks.

If a probability answer is given on the answer line using both incorrect and correct notation, award the marks.

If a probability fraction is given then cancelled incorrectly, ignore the incorrectly cancelled answer.

8 Linear equations

Full marks can be gained if the solution alone is given on the answer line, or otherwise unambiguously indicated in working (without contradiction elsewhere). Where the correct solution only is shown substituted, but not identified as the solution, the accuracy mark is lost but any method marks can be awarded.

9 Parts of questions

Unless allowed by the mark scheme, the marks allocated to one part of the question CANNOT be awarded in another.

10 Money notation

Accepted with and without the “p” at the end.

11 Range of answers

Unless otherwise stated, when any answer is given as a range (e.g. $3.5 - 4.2$) then this is inclusive of the end points (e.g. 3.5, 4.2) and includes all numbers within the range (e.g. 4, 4.1).

1380_2F				
Question	Working	Answer	Mark	Notes
1 (a)		7.7	1	B1 cao
(b)		32	1	B1 cao
(c)		mark -8.3	1	B1 cao
2 (a)(i)		5 or 13	1	B1 for 5 or 13 or both
(ii)		18	1	B1 cao
(iii)		16	1	B1 cao
(b)		reason	1	B1 for valid reason eg 2 goes into 8, a definition of a prime number, or a counter example. B0 for statements that are incorrect or untrue.
3 (i)		143	1	B1 cao
(ii)		reason	1	B1 for <u>angles</u> on a straight <u>line</u> add up to <u>180°</u>
4 (i)		15, 9	5	B2 for both (B1 for 15 or 9)
(ii)		□ □ □ □ □ □ Key: □ = 4		B1 for correct shapes for Bhavini B1 for correct shapes for David B1 for correct key: picture of a box, “4” and = (or is, etc.); accept alternatives that demonstrate 3 and/or 2 and/or 1 with no errors.

1380_2F				
Question	Working	Answer	Mark	Notes
5 (a)		8.4 cm or 84 mm	2	B2 for 8.4 cm $\pm$ 0.2 cm or 84 mm $\pm$ 2 mm or 3.3 inches $\pm$ 0.1 inches (o.e.) (B1 for value without units: 8.4 $\pm$ 0.2 or 84 $\pm$ 2 or 3.3 $\pm$ 0.1 o.e. or if units given, number incorrect, the range of the numerical answer must be as follows: x cm where $6 < x < 11$ or x mm where $60 < x < 110$ or x inches where $2 < x < 5$) otherwise B0
(b)		midpoint drawn	1	B1 for midpoint marked at 4.2 cm $\pm$ 0.2 cm
6		TR TC TG FR FC FG BR BC BG	2	B2 for all 9 (no extras, ignore repeats) (B1 for at least 5 correct)
7 (a)		0.15	1	B1
(b)		$\frac{7}{100}$	1	B1
8 (a)	2.35 + 0.80	3.15	1	B1 cao
(b)	1.70 + 1.70 + 0.65 + 0.65	4.70	2	M1 $2 \times 1.70 + 2 \times 0.65$ oe (units may not be consistent) or 470 A1 cao allow 4.7
(c)	$10 \div 1.30 = 7.6923\dots$	7	2	M1 for $10 \div 1.30$ or an answer between 7.6 and 7.7 inclusive, $7 \times 1.30 (=9.10)$ oe, or successive addition/subtraction where at least 5 are shown. A1 for 7

1380_2F				
Question	Working	Answer	Mark	Notes
9 (a)		D	1	B1 cao
(b)		right angled	1	B1 (accept scalene)
(c)		A and E	1	B1 for both, any order
(d)		2	1	B1 cao
10 (a)		G	1	B1 cao
(b)(i)		3, 1	2	B1 cao
(ii)		0, -2		B1 cao
(c)		plot (-3, 2)	1	B1 cao
11 (a)		$11x$	1	B1 cao
(b)		y^4	1	B1 cao
(c)		$7e + 2f$	2	B2 (B1 for $7e$ or $2f$ seen)
12 (a)	$100 - (57 + 30 + 1.9 + 0.4)$	10.7	2	M1 for $100 - (57 + 30 + 1.9 + 0.4)$ A1 cao
(b)	$(30 \div 100) \times 1\,616\,000$	484 800	2	M1 for $(30 \div 100) \times 1\,616\,000$ oe A1 cao

1380_2F				
Question	Working	Answer	Mark	Notes
13 (a)			1	B1 cao
(b)		10, 12	1	B1 cao
(c)		$2n + 2$	2	B2 for $2n + 2$ oe (B1 for $2n + c$) where c is absent or any number other than 2.
14 (a)		8	1	B1 cao
(b)		7	2	M1 for any attempt to order numbers. A1 cao
(c)	$11 - 2$	9	2	M1 for $11 - 2$ or $2 - 11$ or 2 to 11 or -9 A1 cao
(d)	$(2+3+3+4+7+8+8+8+11) \div 9$ $= 54 \div 9$	6	2	M1 for $(2+3+3+4+7+8+8+8+11) \div 9$ or $54 \div 9$ oe A1 cao
15	$6.2 + 7.3$	13.5	2	B2 for 13.5 (accept $13\frac{1}{2}$ or $\frac{27}{2}$ only) (B1 for 6.2 seen)

1380_2F				
Question	Working	Answer	Mark	Notes
16 (a)	$2x = 10 + 3$	4	1	B1 cao
(b)		18	1	B1 cao
(c)		6.5	2	M1 for $2x = 10 + 3$ or $x - \frac{3}{2} = \frac{10}{2}$ oe or as a first step: intention to +3 to both sides or intention to divide all 3 terms by 2 A1 for 6.5 oe
17		$T = 8x$	2	B2 for $T = 8x$ (B1 for $8x$ or $T =$; B1 for any correct formula)
18	$(3 \times 38) + (5 \times 25) + (1 \times 107)$ $= 114 + 125 + 107 = 346 < 350$	No + reason	3	M1 for at least two of $3 \times 38 (=114)$, $5 \times 25 (=125)$, $1 \times 107 (=107)$ oe A1 for 346 or 4 (more needed) B1 for written conclusion (eg NO) based (dependent) on a comparison between their total and 350 (the 350 does not need to be stated) or a statement explaining the 4 (eg 4 short).

1380_2F										
Question	Working							Answer	Mark	Notes
19	x	-2	-1	0	1	2	3	correct line	3	(Table of values) M1 for at least 2 correct attempts to find points by substituting values of x. M1 ft for plotting at least 2 of their points (any points plotted from their table must be correct) A1 for correct line between -2 and 3 (No table of values) M2 for at least 2 correct points (and no incorrect points) plotted OR line segment of $4x-2$ drawn (ignore any additional incorrect segments) (M1 for at least 3 correct points with no more than 2 incorrect points) A1 for correct line between -2 and 3 (Use of $y=mx+c$) M2 line segment of $4x-2$ drawn (ignore any additional incorrect segments) (M1 for line drawn with gradient of 4 OR line drawn with a y intercept of -2 and a positive gradient) A1 for correct line between -2 and 3

1380_2F				
Question	Working	Answer	Mark	Notes
20 (a)		2 extra triangles	1	B1 for one of the three correct diagrams
(b)		2 extra triangles	1	B1 for the correct diagram
(c)		$\frac{9}{16}$	2	B2 for $\frac{9}{16}$ or 0.5625 (B1 for $\frac{x}{16}$ with $x < 16$, or $\frac{9}{x}$ with $x > 9$)
(d)	$24 \div 3 = 8$, each small side = 2 $24 + (15 \times 2)$	54	3	M1 for $24 \div 3 (=8)$ or $24 \div 12 (=2)$ M1 for $24 + (15 \times 2)$ or $24 + (3 \times 4) + 3 \times (3 \times 2)$ or 27×2 A1 cao OR M1 for $24 + 2$ (outline of inner triangles) M1 for $24 + 2 (3 + 6 + 3 + 3)$ A1 cao
21	$320 \div 5$ $= 64$ $(295 - 64) \div 3$ $= 231 \div 3$	77p or £0.77	4	M1 for $320 \div 5$ or $3.20 \div 5$ or 64 or 0.64 M1 for 295-“64” or 2.95-“0.64” or 231 or 2.31 M1 for $(295 - '64') \div 3$ oe or $(2.95 - '0.64') \div 3$ oe A1 for 77p or £0.77 cao SC B3 for 0.77(p) or (£) 77 or £0.77p without any monetary units.
22 (a)	$1 - (0.2 + 0.1 + 0.5)$ $= 1 - 0.8$	0.2	2	M1 for $1 - (0.2 + 0.1 + 0.5)$ oe A1 for 0.2 oe
(b)	800×0.2	160	2	M1 for 800×0.2 oe A1 cao

1380_2F												
Question	Working	Answer	Mark	Notes								
23		draw rotation	2	B2 for correct rotation, correct centre (B1 for correct orientation or 90° anticlockwise about O)								
24	$\frac{1}{2} (8 \times 15) \times 2 + (17 \times 10)$ $+ (15 \times 10) + (8 \times 10)$ $= 60 + 60 + 170 + 150 + 80$	520	3	M1 a correct expression for area of one face M1 for five area expressions added (at least three correct) A1 cao NB: volume calculated gets 0 marks								
25		<table><tr><td>1</td><td>6 8</td></tr><tr><td>2</td><td>1 5 7 8 8</td></tr><tr><td>3</td><td>0 6 6 6 8</td></tr><tr><td>4</td><td>1 5 8 8</td></tr></table> Key: 1 6 = 16	1	6 8	2	1 5 7 8 8	3	0 6 6 6 8	4	1 5 8 8	3	B2 for a fully correct ordered diagram (B1 for correct unordered diagram or ordered with at most two errors or omissions) B1 for a correct key Accept stem written as 10, 20, 30 etc. but key only acceptable if consistent with this.
1	6 8											
2	1 5 7 8 8											
3	0 6 6 6 8											
4	1 5 8 8											
26	$\frac{3}{4} \times 120 = 90$ $120 - 90 = 30$ left $30 \div 3$	10	3	M1 for $\frac{3}{4} \times 120$ oe or 90 or $\frac{1}{4} \times 120$ oe or 30 M1 (dep) for “30” – $(2 \times \text{“30”} \div 3)$ oe or $\frac{1}{3} \times \text{“30”}$ oe A1 cao								
27	$\pi(6)^2 - \pi(5)^2$ $= 113(.0973...) - 78.5(398...)$ $= 34.55751919$	34.5-34.6	3	M1 for $\pi(6)^2$ oe or $\pi(5)^2$ oe or 113... or 78.5... M1 for $\pi(6)^2 - \pi(5)^2$ oe A1 for 34.5 – 34.6								

1380_2F					
Question	Working		Answer	Mark	Notes
28	x	$x^3 + 5x$	3.7	4	B2 for a trial between 3 and 4 exclusive (B1 for a trial between 3 and 4 inclusive) B1 for a different trial of $3.65 \leq x < 3.7$ B1 (dep on at least one previous B1) for 3.7 For values of x to 1 dp trials should be evaluated to at least 2 significant figs, and for values of x to 2 dp, truncated or rounded to 1 dp. No working scores 0 marks.
	3	42			
	3.1	45.(291)			
	3.4	56.(304)			
	3.5	60.(375)			
	3.6	64.(656)			
	3.7	69.(153)			
	3.8	73.(872)			
	3.9	78.(819)			
	4	84			
	3.65	66.8(7713)			
	3.66	67.3(279)			
	3.67	67.7(8086)			
	3.68	68.2(3603)			
	3.69	68.6(9341)			

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Order Code UG028360 June 2011

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